

TOPAZ INSTALLATION

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1. INTRODUCTION

This installation guide provides information on the installation and verification of the software system TOPAZ Version 3.1. An overview of TOPAZ capabilities, organization, programs and hardware requirements are given in document "TOPAZ Overview". The user should be familiar with the overview document before proceeding with the installation of TOPAZ. TOPAZ operation and application instructions are given in document "TOPAZ User Manual".

TOPAZ is distributed by FTP on the Internet. The installation instructions in this manual refer to the installation to a PC with a DOS or WINDOWS operating system. The user must adapt these instructions to suit user selected computing platform and operating system.

2. INSTALLATION

TOPAZ is provided in two different formats to better serve a wide range of users and computing platforms. The ASCII format directory contains the source code of the programs. Each program must be compiled by the user with a FORTRAN compiler suitable for FORTRAN 90 code. The programs in ASCII format allow the user more flexibility in using the programs on different types of machines and operating systems. The WINEXE format directory contains executable code that will run under the WINDOWS 95/98 operating system. Programs and example input files in the WINEXE directory are contained in self-extracting compressed files for more convenient and faster download.

2.1. ASCII general format code.

The ASCII directory contains the ASCII format version of the TOPAZ programs and all files needed to run them. This directory is for users with non-WINDOWS 95/98 operating systems or who prefer to use their own compiler to create executable programs. This code is compatible with most computing platforms (Such as: Workstation, PC, Mainframe, etc) and operating systems (Such as: DOS, LINUX, UNIX, OS/2, etc). The user must use a suitable FORTRAN compiler for FORTRAN 90 code that is capable of accessing the amount of RAM memory needed for the users application and/or performing disk paging for additional memory if needed.

2.1.1. Contents of the ASCII directory.

The ASCII FTP directory for TOPAZ contains 5 subdirectories:

1) DOCUMENT contains the following TOPAZ literature and documents:

- A) README.ASC: ASCII file containing last minute information.
- B) INSTALL.ASC: Installation manual (This document).
- C) OVERVIEW.ASC: Overview of the operation of software TOPAZ.
- D) USERMAN.ASC: Comprehensive guide for software TOPAZ.

2) PROGRAM contains the following six FORTRAN 90 programs:

- A) DEDNM.F90: Source code for program DEDNM.
- B) RASPRO.F90: Source code for program RASPRO.
- C) RASFOR.F90: Source code for program RASFOR.
- D) RASBIN.F90: Source code for program RASBIN.
- E) NSSTAT.F90: Source code for program NSSTAT.
- F) PARAM.F90: Source code for program PARAM.

3) EXAMINP contains the following six example input files.

- A) DEDNM.INP: Example raster input file for program DEDNM.
- B) DNMCNT.INP: Example control input file for program DEDNM.
- C) NTGCOD.INP: Example network generation code file for program DEDNM.
- D) RASPRO.INP: Example input file for program RASPRO.
- E) RASFOR.INP: Example input file for program RASFOR.
- F) PARAM.INP: Example input file for program PARAM.

4) VERIF1: Contains verification data set 1 (89 files). The names of files contained in the verification directory are given in Section 4 Table 3.1 "File names and extensions for verification data set VERIF1.

5) VERIF2: Contains verification data set 2 (89 files). The names of files contained in the verification directory are given in Section 4 Table 3.1 "File names and extensions for verification data set VERIF1.

2.1.2. Installation of ASCII files.

The installation of TOPAZ ASCII files consists of the following steps:

- 1) Download the TOPAZ program files from the PROGRAM directory into an empty directory. The user may select any name for this directory. For explanation purposes, this directory is referred to as MAIN in the following discussion.
- 2) Download the TOPAZ example input files from the EXAMINP directory to directory MAIN. Thereafter, directory MAIN should contain six TOPAZ programs (files with extension .F90) and six example input files (files with extension .INP). The names of the TOPAZ programs and example input files are given in Section 4 Table 2.1 "Names of TOPAZ programs and executable files" and Table 2.2 "Names of example input files for TOPAZ".
- 3) Download the TOPAZ verification files from the VERIF1 and VERIF2 directories to directories of corresponding names. Each directory should contain 89 files. The names of the verification files are given in Section 4 Table 3.1 "File names and extensions for verification data set VERIF1".
- 4) Download the TOPAZ documentation files from the DOCUMENT directory to a directory of similar name. The directory should contain 4 documents in ASCII format.

- 5) Compile and link the source code of the TOPAZ programs using a suitable FORTRAN compiler. The source code of each program must be compiled and linked individually into a corresponding executable file. Program names, corresponding names of source code files and names that should be assigned to executable files are given in Section 4, Table 2.1 "Names of TOPAZ programs and executable files". The source code of all programs conforms strictly to FORTRAN 90 standards. Compilation errors or warnings may be the result of extensions or limitations of the user's FORTRAN 90 compiler. The user may want to contact the developers for additional information.
- 6) Execute program DEDNM with the given example input files. All six example input files listed in Section 4 Table 2.2 "Names of example input files for TOPAZ" should be in directory MAIN. The program automatically accesses the input files it needs. During execution the request for interactive user input to proceed with the given row/column of the watershed outlet must be answered by entering a 1, followed by the return key. If the last message to the screen is "Normal program termination", then the program has executed correctly. Do not delete any of the generated output files, they are needed by other TOPAZ programs in subsequent installation steps.
- 7) Execute, in turn, programs RASPRO, RASFOR, RASBIN, NSSTAT and PARAM without adding, deleting, replacing or editing any of the example input files or generated output files. If all programs end with the message "Normal program termination", then TOPAZ has been correctly installed and is ready for operation.

2.2. WINDOWS 95/98 executable files

This directory contains pre-compiled executable programs. These programs have been compiled and optimized to run under the WINDOWS 95/98 operating system. They will not correctly execute under any other operating system including WINDOWS 3.1 or DOS.

2.2.1 Contents of the WINEXE directory.

The WINEXE FTP directory for TOPAZ contains one ASCII file and four self- extracting compressed files:

- 1) README.DOS: ASCII file containing last minute information.
- 2) DOCUMENT.EXE: Compressed file containing the TOPAZ manuals.
- 3) TOPAZ.EXE: Compressed file containing the TOPAZ executable code and input files.
- 4) VERIF1.EXE: Compressed file containing verification data set 1.
- 5) VERIF2.EXE: Compressed file containing verification data set 2.

2.2.2 Installation of WINEXE files.

The installation of TOPAZ WINEXE files consists of the following steps:

- 1) Download the self-extracting compressed file TOPAZ.EXE from the WINEXE directory into an empty directory. The user may select any name for this directory. For explanation purposes, this directory is referred to as MAIN in the following discussion.
- 2) Download the self-extracting compressed files VERIF1.EXE and VERIF2.EXE from the WINEXE directory into separate empty directories. The user may select any names for these directories. For explanation purposes, the directories will be referred to as VERIF1 and VERIF2 in the following discussion.
- 3) Download the self-extracting compressed file DOCUMENT.EXE from the WINEXE directory into an empty directory of a similar name. Execute the file DOCUMENT.EXE to obtain the three ASCII manuals.
- 4) In directory MAIN, execute the file TOPAZ.EXE to uncompress the program executables and corresponding example data files and library files. After completion of this step, the user may delete file TOPAZ.EXE from directory MAIN. Thereafter, directory MAIN should contain six TOPAZ programs (files with extension .EXE) and six example input files (files with extension .INP) and one dynamically linked library (with extension .dll). The names of the TOPAZ programs and example input files are given in Section 4 Table 2.1 "Names of TOPAZ program executable files", Table 2.2 "Names of example input files for TOPAZ", and Table 2.3 "Names of library files for TOPAZ".
- 5) In directory VERIF1 and VERIF2, execute the files VERIF1.EXE and VERIF2.EXE to uncompress the verification data set files. The names of the files contained in the verification directories are given in Section 4 Table 3.1 "File names and extensions for verification data set VERIF1".
- 6) Execute program DEDNM with the given example input files. All six example input files listed in Section 4 Table 2.2 "Names of example input files for TOPAZ", and the library file listed in Section 4 Table 2.3 "Names of library files for TOPAZ" should be in directory MAIN. The program automatically accesses the input files it needs. During execution the request for interactive user input to proceed with the given row/column of the watershed outlet must be answered by entering a 1, followed by the return key. If the last message to the screen is "Normal program termination", then the program has executed correctly. Do not delete any of the generated output files, they are needed by other TOPAZ programs in subsequent installation steps.
- 7) Execute, in turn, programs RASPRO, RASFOR, RASBIN, NSSTAT and PARAM without adding, deleting, replacing or editing any of the example input files or generated output files. If all programs end with the message "Normal program termination", then TOPAZ has been correctly installed and is ready for operation.

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3. VERIFICATION

Upon successful completion of the installation, TOPAZ is ready for operation. Before proceeding with applications, it is recommended, but not required, to verify TOPAZ for proper operation using pre-defined input verification data and comparing the results with known output data. To verify TOPAZ, complete the following steps for the two verification data sets provided in directories VERIF1 and VERIF2. For discussion purposes only the steps for performing the verification with set VERIF1 are provided.

- 1) Copy all files with extension .INP from directory VERIF1 into directory MAIN.
- 2) Execute program DEDNM with these verification input files. During execution the request for interactive user input to proceed with the given row/column of the watershed outlet must be answered by entering a 1, followed by the return key. A warning message immediately appears saying that the watershed boundary touches an area of indeterminate elevation. The user must enter a 1, followed by the return key, to proceed with the verification. The program then completes with the message "Normal program termination".
- 3) Execute, in turn, programs RASPRO, RASFOR, RASBIN, NSSTAT and PARAM without adding, deleting, replacing or editing any of the verification input files or generated output files.
- 4) Compare the resulting output files listed in Section 4, Table 3.2 "List of verification output files" with the corresponding output files in the verification directory VERIF1. If the compared files are identical, then the verification has been successfully completed. If differences are found, the user may want to check that these differences are rounding errors resulting from machine precision. If so, the verification can be considered successful. However, if the differences are significant, the user may want to contact the program developers for additional information.

4. TABLES

Table 2.1 Names of TOPAZ programs and executable files.

| Program Name (ASCII directory) | Executable File Name (WINEXE directory) |
|--------------------------------------|-----------------------------------------------|
| DEDNM.F90 | DEDNM.EXE |
| RASPRO.F90 | RASPRO.EXE |
| RASFOR.F90 | RASFOR.EXE |
| RASBIN.F90 | RASBIN.EXE |
| NSSTAT.F90 | NSSTAT.EXE |
| PARAM.F90 | PARAM.EXE |

Table 2.2 Names of example input files for TOPAZ.

| | |
|------------|------------|
| DNMCNT.INP | RASPRO.INP |
| DEDNM.INP | RASFOR.INP |
| NTGCOD.INP | PARAM.INP |

Table 2.3 Names of library files for TOPAZ.

| |
|--------------|
| SALFLIBC.DLL |
|--------------|

Table 3.1 File names and extensions for verification data set VERIF1.

| | | |
|------------|------------|------------|
| DNMCNT.INP | BOUND.OUT | BOUND.DAT |
| DEDNM.INP | DEPFLT.OUT | DEPFLT.DAT |
| RASFOR.INP | ELVCLA.OUT | ELVCLA.DAT |
| RASPRO.INP | FILDEP.OUT | FILDEP.DAT |
| NTGCOD.INP | FLOPAT.OUT | FLOPAT.DAT |
| PARAM.INP | FLOVEC.OUT | FLOVEC.DAT |
| DEDNM.RPT | FVASPE.OUT | FVASPE.DAT |
| RASFOR.RPT | FVSLOP.OUT | FVSLOP.DAT |
| RASBIN.RPT | INELEV.OUT | INELEV.DAT |
| RASPRO.RPT | NETFUL.OUT | NETFUL.DAT |
| NSSTAT.RPT | NETW.OUT | NETW.DAT |
| PARAM.RPT | NETWE.OUT | NETWE.DAT |
| OUTCHA.UNF | NTGCOD.OUT | NTGCOD.DAT |
| OUCNT.UNF | RELIEF.OUT | RELIEF.DAT |
| OUTCAT.UNF | SMOOTH.OUT | SMOOTH.DAT |
| RBNET.UNF | SUBBDA.OUT | SUBBDA.DAT |
| RBSBC.UNF | SUBBDB.OUT | SUBBDB.DAT |
| RBKEY.UNF | SUBWTA.OUT | SUBWTA.DAT |
| CATWIN.TAB | SUBWTB.OUT | SUBWTB.DAT |
| NETW.TAB | TASPEC.OUT | TASPEC.DAT |
| NETWB.TAB | TSLOPE.OUT | TSLOPE.DAT |
| SBCT.TAB | UPAREA.OUT | UPAREA.DAT |
| SBCTB.TAB | HSLOPE.OUT | HSLOPE.DAT |
| SBCTA.TAB | INDTAR.OUT | INDTAR.DAT |
| SBCTL.TAB | ELDCHA.OUT | ELDCHA.DAT |
| SBCTS.TAB | ELDOUT.OUT | ELDOUT.DAT |
| ELVBND.TAB | DISCHA.OUT | DISCHA.DAT |
| NETWT.EVL | DISOUT.OUT | DISOUT.DAT |
| SBCTT.EVL | NTWINT.FIL | CELSLP.LST |
| FPSLOP.LST | TOPSLP.LST | |

Table 3.2 List of verification output files.

| | |
|-----------------|---------------------------------|
| Program DEDNM: | NETW.TAB; SBCT.TAB |
| Program RASPRO: | RASPRO.RPT; ELVBND.TAB |
| Program RASFOR: | all files with extension .DAT |
| Program RASBIN: | NETWB.TAB; SBCTB.TAB |
| Program NSSTAT: | NETWT.EVL; SBCTT.EVL |
| Program PARAM: | SBCTS.TAB; SBCTL.TAB; SBCTA.TAB |

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